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ning of each regular issue of the PCT Gazette.

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(54) Title: NUCLEIC ACID MOLECULES ASSOCIATED WITH MELANOMA AND THYROID TUMORS

(57) Abstract: The present invention relates to isolated nucleic acid molecules associated with melanoma or thyroid tumors and compositions derived therefrom. The present invention further relates to methods for diagnosing and treating melanoma, thyroid tumors and other related pathological conditions such as rectal cancer, lung cancer, breast cancer and colon cancer, by employing such nucleic acid molecules and compositions.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/04929

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/12 C07K14/47 C07K16/18 C12Q1/68 G01N33/53
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According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C07K C12N C12Q G01N A61K A61P

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SULLIVAN: "Human hCENP-B gene for centromere autoantigen B" EMBL DATABASE ACC NO: X55039, 2 August 1991 (1991-08-02), XP002141627 abstract	1,2,9-14
X	--- STRAUSBERG ET AL.: "National cancer institute, cancer genome anatomy project (CGAP)" EMBL DATABASE ACC. NO: A1239958, 5 November 1998 (1998-11-05), XP002141437 the whole document	1,2,9-14
A	--- US 5-196 307 A (EARNSHAW WILLIAM ET AL) 23 March 1993 (1993-03-23) claims 1-10; figures 2-4; examples 1-7 --- ... - / - -	1,2, 9-17, 29-31, 33,49,52

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

3 July 2000

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International Application No

PCT, JS 00/04929

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	<p>US 5 804 381 A (OLD LLOYD J ET AL) 8 September 1998 (1998-09-08)</p> <p>claims 1-8; examples 1-5; tables 1-4</p> <p>---</p>	<p>1,2, 9-19, 25-31, 33-35, 41-43</p>
A	<p>WO 99 04040 A (LUDWIG INST CANCER RES) 28 January 1999 (1999-01-28)</p> <p>page 1, line 12 - line 20 page 8, line 1 - line 16 claims 1-64</p> <p>---</p>	<p>1,2, 9-19, 25-31, 33-35, 41-43, 49,51,52</p>
A	<p>TÜRECI ET AL.: "The SSX-2 gene, which is involved in the t(X;18) translocation of synovial sarcomas, codes for the human tumor antigen HOM-MEL-40" CANCER RESEARCH, vol. 56, 15 October 1996 (1996-10-15), pages 4766-4772, XP002141438 abstract page 4767, column 2 -page 4771, column 1; figures 1-4; tables 1-4</p> <p>-----</p>	<p>1,2, 9-19, 25-31, 33-35, 41-43, 49,51,52</p>

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 00/04929

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 33-35, 41-43 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Claims 1,9-19,25-31,33-35,41-43,49,51,52 partially & Claim 2 completely.

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1,9-19,25-31,33-35,41-43,49,51,52 partially,
2 complete

An isolated nucleic acid molecule or a part thereof having a sequence as set forth in SEQ ID NO: 3. An isolated nucleic acid molecule complementary or hybridizing to SEQ ID NO:3. An isolated protein encoded by the above mentioned nucleic acid molecule. An isolated antibody specific for a protein encoded by said nucleic acid molecule. An expression vector comprising the above mentioned nucleic acid molecule. A cell transformed or transfected with the above mentioned expression vector. The above mentioned cell wherein said cell is an antigen presenting cell. An isolated peptide/HLA complex wherein said peptide is encoded by a fragment of SEQ ID NO: 3. A method for diagnosing a pathological condition, wherein said condition is characterized by an abnormal expression of a nucleic acid sequence comprising SEQ ID NO:3. A composition comprising a carrier and an antibody directed against a protein encoded by SEQ ID NO:3 or a part thereof. A composition comprising a carrier and an immunogenic cell, wherein said cell expresses a peptide complexed with an MHC molecule, said peptide being encoded by a fragment of SEQ ID NO:3. A method for treating a patient afflicted with a pathological condition wherein said condition is characterized by an abnormal expression of a nucleic acid molecule of SEQ ID NO:3; said method comprising administering to said patient at least one of: an antisense DNA of said nucleic acid molecule, said protein, said antibody or said cell expressing said MHC/peptide complex. A method for treating a patient afflicted with a pathological condition wherein said condition is characterized by an abnormal expression of a nucleic acid molecule of SEQ ID NO:3; said method comprising: removing an immuno-reactive cell containing sample of the patient, contacting said sample with immunogenic cells expressing a peptide encoded by a fragment of said nucleic acid molecule complexed with an MHC molecule, selecting cytolytic T cells and introducing the T cells to said patient. A method of identifying the association of a pathological condition with the abnormal expression of SEQ ID NO:3, comprising obtaining the serum from a patient and detecting the presence of an antibody specific for an antigen encoded by said nucleic acid molecule.

2. Claims: 1,9-19,25-31,33-35,41-43,49,51,52 partially,
3 complete

As invention 1, for SEQ ID NO:7

3. Claims: 1,9-18,20-22,24-34,36-38,40-42,44-46,48,49,51,
52 partially, 4 complete

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

As invention 1, for SEQ ID NO:14

4. Claims: 9-18,20-34,36-42,44-49,51,52 partially, 5 complete

As invention 1, for SEQ ID NO: 15

5. Claims: 1,9-18,20,25-34,36,41,42,44,49,51,52 partially,
6 complete

As invention 1, for SEQ ID NO: 17

6. Claims: 1,9-18,20,24-34,36,40-42,44,48,49,51,52 partially,
7 complete

As invention 1, for SEQ ID NO: 19

7. Claims: 1,9-18,20-22,24-34,36-38,40-42,44-46,48,49,51,
52 partially, 8 complete

As invention 1, for SEQ ID NO: 20

8. Claims: 17-19,21,22,24-31,33-35,37,38,40-43,45,46,48,49,51,
52 partially

A method for diagnosing a pathological condition, wherein said condition is characterized by an abnormal expression of a nucleic acid sequence comprising SEQ ID NO:21. A composition comprising a carrier and an antibody directed against a protein encoded by SEQ ID NO:21 or a part thereof. A composition comprising a carrier and an immunogenic cell, wherein said cell expresses a peptide complexed with an MHC molecule, said peptide being encoded by a fragment of SEQ ID NO:21. A method for treating a patient afflicted with a pathological condition wherein said condition is characterized by an abnormal expression of a nucleic acid molecule of SEQ ID NO:21; said method comprising administering to said patient at least one of: an antisense DNA of said nucleic acid molecule, said protein, said antibody or said cell expressing said MHC/peptide complex. A method for treating a patient afflicted with a pathological condition wherein said condition is characterized by an abnormal expression of a nucleic acid molecule of SEQ ID NO:21; said method comprising: removing an immuno-reactive cell containing sample of the patient,

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

contacting said sample with immunogenic cells expressing a peptide encoded by a fragment of said nucleic acid molecule complexed with an MHC molecule, selecting cytolytic T cells and introducing the T cells to said patient.
A method of identifying the association of a pathological condition with the abnormal expression of SEQ ID NO:21, comprising obtaining the serum from a patient and detecting the presence of an antibody specific for an antigen encoded by said nucleic acid molecule.

9. Claims: 17-19,21,24-31,33-35,37,40-43,45,48,49,51,
52 partially

As invention 8 for SEQ ID NO:22

10. Claims: 17-19,21-31,33-35,37-43,45,46,49-52 partially

As invention 8 for SEQ ID NO:23

11. Claims: 17-19,21-31,33-35,37-43,45,46,49-52 partially

As invention 8 for SEQ ID NO:24

12. Claims: 17-19,22,25-31,33-35,38,41-43,46,49,51,52 partially

As invention 8 for SEQ ID NO:25

13. Claims: 17,18,20,21,24-31,33,34,36,37,40-42,44,45,48,49,51,
52 partially

As invention 8 for SEQ ID NO:26

14. Claims: 17,18,20,25-31,33,34,36,41,42,44,49,51,52 partially

As invention 8 for SEQ ID NO:27

15. Claims: 17,18,20,25-31,33,34,36,41,42,44,49,51,52 partially

As invention 8 for SEQ ID NO:28

16. Claims: 17,18,20,24-31,33,34,36,40-42,44,48,49,51,
52 partially

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

As invention 8 for SEQ ID NO:29

17. Claims: 17,18,20,21,24-31,33,34,36,37,40-42,44,45,48,49,51,
52 partially

As invention 8 for SEQ ID NO:30

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/JS 00/04929

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5196307 A	23-03-1993	NONE	
US 5804381 A	08-09-1998	AU 4349597 A CN 1232467 A EP 0948518 A WO 9814464 A	24-04-1998 20-10-1999 13-10-1999 09-04-1998
WO 9904040 A	28-01-1999	US 5888751 A AU 8264998 A CN 1263560 T EP 0998582 A ZA 9806277 A	30-03-1999 10-02-1999 16-08-2000 10-05-2000 15-04-1999